

## **REMARKS**

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 16-32 were pending. By the present response, claims 16, 21, 25 and 30 have been amended, claim 23 canceled, and claims 33-34 added. Thus, upon entry of the present response, claims 16-22 and 24-34 remain pending and await further consideration on the merits.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: page 7, lines 24-28; page 8, lines 1-11; and page 9, lines 12-24.

Applicant wishes to thank Examiners Graham and Marcheschi for the courtesies extended to applicant's representative during a personal interview conducted on October 16, 2009 in the U.S. Patent and Trademark Office. During the interview, it was agreed that the foregoing amendments would serve to overcome the current grounds for rejection. In addition, applicant wishes to thank the Examiners for the thoughtful and constructive discussion of the features of the presently claimed invention relative to the disclosure of the prior art references of record. It was also indicated that the Examiners believed that a further search and/or consideration of the presently claimed invention would be required.

## ***CLAIM REJECTIONS UNDER 35 U.S.C. §103***

Claims 16-29 and 30-32 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application Publication No. 2005/0066571 to

Wakefield (hereafter "*Wakefield*") in view of U.S. Patent No. 5,880,241 to Brookhart et al. (hereafter "*Brookhart et al.*") on the grounds set forth in paragraph 6 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

The present invention is directed to a colloidal dispersion having a formulation which renders it suitable for certain uses, such as a fuel additive. The colloidal dispersion of the present invention comprises particles of a rare earth compound, an acid and an organic phase, as well as an antioxidant. The presence of an antioxidant provides the colloidal dispersion with the advantage of making the stability of the dispersion independent of, for example, the diesel fuel in which it is incorporated. (See, e.g., page 2, lines 9-12 of the present specification.)

A colloidal dispersion formed according to the principles of the present invention is set forth in claim 16. Claim 16 recites:

*16. A colloidal dispersion comprising particles of a rare earth compound, an acid, an organic phase, and an antioxidant; wherein at least 90% by weight of the particles are monocrystalline.*

According to a further aspect, a colloidal dispersion formed according to the principles of the present invention is defined by amended claim 25. Amended claim 25 recites:

*25. A colloidal dispersion comprising particles of a rare earth compound, an acid, an organic phase, and an antioxidant, wherein the particles are not larger than 200 nm, said dispersion having the following characteristics:  
said particles are in the form of aggregates of crystallites whose  $d_{80}$ , advantageously  $d_{90}$ , is not more than 5 nanometers, 90% (by weight) or more of the aggregates comprising 1 to 5 crystallites; and the acid is an amphiphilic acid comprising at least one acid with 11 to 50 carbon atoms, having at least one alpha, beta,*

*gamma, or delta branch of the atom bearing the acidic hydrogen.*

According to yet another aspect, a fuel additive formulated according to the principles of the present invention is set forth in amended claim 30. Amended claim 30 recites:

30. (Currently Amended) *A fuel additive in the form of a colloidal dispersion, the colloidal dispersion comprising particles of a rare earth compound, an acid, an organic phase, an antioxidant, and an element E, wherein an atomic ratio of antioxidant to rare earth compound and the element E is 0.2 to 5.0.*

*Wakefield* is directed to a fuel or fuel additive which comprises particles of cerium oxide which have been doped to improve the catalytic efficiency of the cerium oxide. However, *Wakefield* fails to disclose a colloidal dispersion having the formulation set forth in claim 16 above.

It is asserted in paragraph 5 of the Official Action that *Wakefield* teaches: "a fuel of fuel additive comprising. . . an antioxidant that is phenolic, an alkylphenol such as 2,6-di-tert-butylphenol (paragraph 53); and an organic carboxylic acid (paragraph 27) which is an amphiphilic acid."

However, with respect to the antioxidant, paragraph [0053] of *Wakefield* merely describes the use of antioxidants as potential diesel fuel additives. The cited portion of *Wakefield* does not support the assertion that *Wakefield* discloses a colloidal dispersion which includes an antioxidant. Similarly, with respect to the organic acid, the description appearing in paragraph [0027] of *Wakefield* describes the use of an organic acid as a coating agent for coating the cerium oxide particles. *Wakefield* does not disclose that this organic acid remains and forms part of a colloidal dispersion as required by the presently claimed invention.

As noted above, the colloidal dispersion of the present invention which includes, *inter alia*, an antioxidant and an organic acid, provides the advantage of improving the stability of the dispersion, regardless of the composition of the fuel into which it may be incorporated. *Wakefield* fails to contain any such disclosure.

*Brookhart et al.* is cited as teaching a crystallinity of at least 20%. Therefore, even if the teachings of *Brookhart et al.* were applied exactly as suggested in the grounds for rejection, the claimed invention would not result. Namely, *Brookhart et al.* fails to cure the deficiencies previously noted above in connection with the teachings of *Wakefield*.

Moreover, as evident from the above, amended claim 16 further requires that "at least 90% by weight of the particles are monocrystalline." This limitation previously appeared in claim 23. In the rejection of claim 23 it was asserted that *Brookhart et al.* teaches this limitation at column 65. However, this portion of the *Brookhart et al.* disclosure concerns the amount of polymer which is crystalline, versus the amount of polymer which remains amorphous. This disclosure of *Brookhart et al.* does not bear any relevance with respect to the amount of particles in a colloidal dispersion which are monocrystalline. Thus, amended claim 16 is further distinguishable over the applied prior art for at least this additional reason.

Claim 25 has been rewritten in independent form. As evident from the above, amended claim 25 requires, *inter alia*, 90% by weight or more of the aggregates comprising 1-5 crystallites. *Brookhart et al.* contains no disclosure concerning the morphology of the particles contained in a dispersion, much less the amount of aggregates comprising 1-5 crystallites as required by amended claim 25. Thus,

amended claim 25 is distinguishable over the applied prior art for at least these additional reasons.

Amended claim 30 recites a fuel additive which includes, *inter alia*, an element E, wherein an atomic ratio of antioxidant to rare earth compound and the element E is 0.2 to 5.0. It was alleged in the grounds for rejection that the relative amounts of the constituent components would have been obvious due to routine optimization of the prior art. This assertion is respectfully traversed. In order for such a variable to be found obvious as a result of routine optimization, the prior art must first recognize the parameter as a result effective variable. See, e.g., M.P.E.P. § 2144.05 ("the prior art did not recognize the treatment capacity as a function of the tank volume to contract a ratio, and therefore the parameter optimized was not recognized in the art to be a result-effective variable."). Therefore, the grounds for rejection, as it would be applied to amended claim 30, is respectfully traversed for at least this additional reason.

In addition, it is also asserted in paragraph 5 of the Official Action that "both references teach fuel additives." The only reference that applicant can find in *Brookhart et al.* using the polymers described therein as additives is in connection with lubricating oil additives. This portion of the *Brookhart et al.* disclosure (column 55, lines 50-55) is cited in paragraph 5 of the Official Action in support of the rejection. However, applicant respectfully submits that it would not have been obvious to one of ordinary skill in the art to have modified a fuel or fuel additive with a lubricating oil additive, as alleged in the grounds for rejection. The purposes of the two additives are completely different from one another, and thus would not suggest their combination to one of ordinary skill in the art.

For at least the reasons noted above, reconsideration and withdrawal of the rejection is respectfully requested.

The remaining claims depend from claim 16 or 30. Thus, these claims are also distinguishable over the proposed combination of *Wakefield* and *Brookhart et al.* for at least the same reasons noted above.

**CONCLUSION**

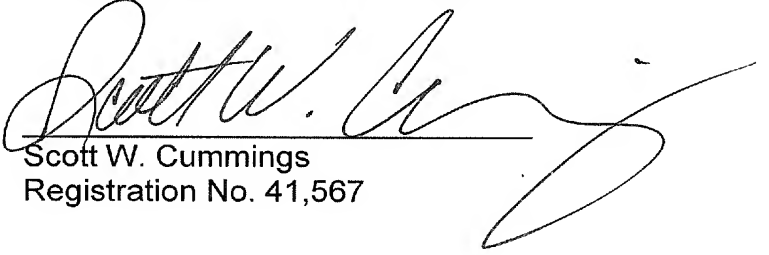
From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

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